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**IN THE UNITED STATES PATENT & TRADEMARK OFFICE**

Applicant: Robb R. Gardner et al : Paper No.:  
Serial No.: 09/778,678 : Group Art Unit: 1771  
Filing Date: February 7, 2001 : Examiner: L. Salvatore  
For: **Enhanced Fabric Comprising Substrates and Process to Provide Same**

**REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. 1.116**

Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
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Dear Sir:

In response to the Official Action dated June 20, 2003, Applicants request reconsideration of the patentability of claims 1-24 in view of the following remarks.

**REMARKS**

The Official Action dated June 20, 2003 has been carefully considered. Accordingly, it is believed that the following remarks demonstrate the patentability of claims 1-24 and place the present application in condition for allowance. Reconsideration is respectfully requested.

Claims 1-4, 7, 8, 12 and 15-24 were rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over the Takumi Japanese Publication 05-059664. The Examiner asserted that Takumi discloses a fiber finishing

method which includes immersing a cellulosic fabric in a solution of polyethylene glycol having a molecular weight ranging from 90-5000 gm/mol, drying the fabric, exposing the fabric to formaldehyde vapor in the presence of a catalyst and heat curing. The Examiner further asserted that the claimed properties are inherent in the invention of Takumi since Takumi uses like materials and like processes.

As will be set forth in detail below, Applicants submit that the substrates, articles of manufacture and processes defined by present claims 1-4, 7, 8, 12 and 15-24 are neither anticipated by nor rendered obvious over the teachings of Takumi. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

According to claim 1, the invention is directed to a substrate comprising fabric. The substrate is treated with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst. The treated substrate has at least three enhanced fabric benefits selected from the group consisting of i) durable press, as compared with untreated fabric; ii) hand feel, as compared with untreated fabric; iii) anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol; iv) anti-shrinking, as compared with untreated fabric; and v) anti-yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

According to claim 23, the invention is directed to an article of manufacture comprising fabric made up of woven or non-woven fibers. The fabric has at least three enhanced fabric benefits selected from the group consisting of i) durable press, as compared with fabric made up of untreated fibers; ii) hand feel, as compared with fabric made up of untreated fibers; iii) anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol; iv) anti-shrinking, as

compared with fabric made up of untreated fibers; and v) anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol. The benefits are achieved by treating the fibers with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst.

Finally, according to claim 24, the invention is directed to a process for providing at least three enhanced benefits to a fabric fiber-comprising substrate. The benefits are selected from the group consisting of i) durable press, as compared with untreated fabric fiber-comprising substrate; ii) hand feel, as compared with untreated fabric fiber-comprising substrate; iii) anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol; iv) anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and v) anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol. The process comprises the steps of treating a fabric fiber-comprising substrate with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and curing the composition on the surface of the substrate.

As set forth in the present specification, for example at page 2, beginning at line 8, many conventional improvements or enhancements to fabric are accompanied by disadvantageous consequences. For example, various processes which provide permanent press properties require strong acidic conditions which can significantly reduce fabric strength. The addition of anti-static or softening agents can cause fabric to prematurely abrade. On the other hand, the present invention provides fabric substrates and articles of

manufacture which exhibit combinations of improved properties, so that enhancements are not accompanied by unacceptable fabric property degradation.

Takumi discloses a method for resin finishing of a fiber product. A cellulosic fiber product is immersed in an aqueous solution of a polyhydric alcohol, uniformly dried, exposed to formaldehyde vapor and then provided with a catalyst such as sulfur dioxide gas and heat treated. Takumi discloses that ethylene glycol or polyethylene glycol having 90-5000 molecular weight are preferred and that the amount of the remaining formaldehyde is suppressed to a low content to provide wrinkle preventing properties and shrink preventing properties without reducing strength.

However, Applicants find no teaching or suggestion by Takumi of a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst. Similarly, Applicants find no teaching or suggestion by Takumi of a process wherein a substrate is treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst. Rather, Takumi discloses sequential steps of treatment with a polyhydric alcohol, followed by exposure to formaldehyde vapor, followed by provision of a catalyst. Thus, contrary to the Examiner's assertion in the Official Action, Takumi does not disclose a like process as Takumi employs a formaldehyde vapor contact step, separate from the polyhydric alcohol treatment step, followed by yet another separate acid treatment step.

One skilled in the art will appreciate that a method as taught by Takumi, wherein polyhydric alcohol treatment is followed by exposure to formaldehyde vapor, can result in differing degrees of formaldehyde crosslinking as the amount of formaldehyde contact with the cellulosic fibers is limited both by the polyhydric alcohol pretreatment and the vapor phase of the formaldehyde. In fact, Takumi indicates that formaldehyde on the product is

suppressed to a low amount. Accordingly, it cannot be assumed that the product of Takumi will have properties exhibited by the presently claimed substrates and articles of manufacture, and particularly at least three enhanced fabric benefits, or that the process of Takumi will provide such a product.

The Examiner asserts in the Official Action that Applicants are claiming a composition, not the amounts of each constituent used or present in the final product structure. However, Applicants are not merely claiming compositions. To the contrary, Applicants are claiming a substrate comprising fabric treated with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and having at least three enhanced fabric benefits selected from a specified group of benefits (claim 1). The recited benefits result from the specified treatment with the specified composition. Takumi does not teach the treatment composition of claim 1, nor the treatment process of claim 1, nor the combination of benefits required by claim 1. Moreover, Takumi does not teach modifying the disclosed treatment process, particularly to result in a substrate having the combination of benefits of claim 1. In fact, the modifications of Takumi necessary to result in the limitations of claim 1 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

Moreover, the invention is directed to an article of manufacture comprising fabric made up of woven or non-woven fibers, having at least three enhanced fabric benefits selected from a specified group, achieved by treating the fibers with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst (claim 23). Again, Applicants are not merely claiming a composition as asserted by the Examiner. The recited benefits result from the specified treatment with the specified composition. Takumi does not teach the

treatment composition of claim 23, nor the combination of benefits required by claim 23. Moreover, Takumi does not teach modifying the disclosed sequential treatment process, particularly to result in a fabric having the combination of benefits of claim 23. In fact, as noted above, the modifications of Takumi necessary to result in the limitations of claim 23 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

Finally, the invention is directed to a process for providing at least three enhanced benefits selected from a specified group to a fabric fiber-comprising substrate by treating a fabric fiber comprising substrate with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and curing said composition on the surface of said substrate (claim 24). Again, Applicants are not merely claiming a composition as asserted by the Examiner. Rather, Applicants are claim a process to provide specified benefits, which process employs defined steps and composition. Takumi does not teach the process of obtaining the claimed combination of benefits, nor the recited steps, nor the recited treatment composition. Moreover, as noted above, Takumi does not teach modifying the disclosed sequential treatment composition or process, particularly to result in a fabric substrate having the claimed combination of benefits of claim 24. In fact, as noted above, the modifications of Takumi necessary to result in the process of claim 24 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

It is not surprising then that Applicants find no teaching or suggestion by Takumi regarding substrates or articles of manufacture as recited in claims 1 and 23, exhibiting at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, or a process for providing

such as recited in claim 24. Moreover, in view of the process and compositional differences discussed above, it cannot be assumed that the sequential method and formaldehyde vapor teachings of Takumi inherently result in such a product.

Anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference, *In re Robertson*, 49 U.S.P.Q.2d 1949, 1950 (Fed Cir. 1999). In view of the failure of Takumi to disclose substrates or articles treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst as required by the present claims, or provision of at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, Takumi does not expressly or inherently describe each and every element as set forth in the claims. Thus, Takumi does not anticipate claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102.

In order to render a claimed invention obvious, the prior art must enable one skilled in the art to make and use the claimed invention, *Motorola, Inc. v. Interdigital Tech. Corp.*, 43 U.S.P.Q.2d 1481, 1489 (Fed. Cir. 1997). In view of the failure of Takumi to disclose the treatment composition as presently claimed, a treatment process as presently claimed or any motivation for modifying the Takumi process to obtain the combinations of benefits as presently claimed in a substrate comprising treated fabric or an article of manufacture comprising fabric made up of woven or non-woven fibers, Takumi does not enable one skilled in the art to make and use the presently claimed invention. In fact, it is error to find obviousness where references diverge from and teach away from the invention at hand, *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). As the modifications of Takumi necessary to result in the substrate of claim 1, the article of manufacture of claim 23 or the process of claim 24 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde

use obtained by the formaldehyde vapor treatment of Takumi, it is error to find the presently claimed invention obvious in view of Takumi. Thus, Takumi does not render claims 1-4, 7, 8, 12 and 15-24 obvious under 35 U.S.C. §103.

It is therefore submitted that the rejection under 35 U.S.C. §102 or §103 has been overcome. Reconsideration is respectfully requested.

Claims 5, 6 and 9-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takumi in view of the Payet published International Application WO 99/58758. The Examiner asserted that Payet teaches the use of a composition comprising formaldehyde, a catalyst and a silicone elastomer. The Examiner further asserted that it would have been obvious to one skilled in the art to use the specific catalyst of Payet, to use a higher amount of catalyst than taught by Payet, and to use the formaldehyde solution of Payet in the invention of Takumi. In reply to Applicants' previous arguments, the Examiner asserted that Payet teaches using less formaldehyde than other known processes and further teaches removing residual formaldehyde.

As will be set forth in detail below, Applicants submit that the substrates defined by present claims 5, 6 and 9-14 are nonobvious over and patentably distinguishable from the teachings of Takumi in view of Payet. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The substrates of claim 1, from which claims 5, 6 and 9-14 depend, are discussed above, as are the deficiencies of Takumi. These deficiencies are not resolved by Payet. That is, while Payet discloses compositions of formaldehyde, a catalyst and a silicone elastomer for treatment of fabric, Applicants find no teaching by Payet of compositions comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst as required by the present claims. Similarly, Applicants find no teaching by Payet of fabric which is treated with such compositions to



provide at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, as recited in claim 1.

Moreover, one skilled in the art would not find it obvious to combine the teachings of Payet, and particularly one skilled in the art would not find it obvious to use a liquid formaldehyde treatment solution as taught by Payet, in the formaldehyde vapor process of Takumi. That is, Takumi has as an objective to provide a product using formaldehyde vapor to suppress formaldehyde to a low content. Accordingly, use of a liquid formaldehyde treatment solution as taught by Payet would encourage greater formaldehyde-fabric contact and therefore would be contrary to the objective of Takumi. Thus, one skilled in the art would not find it obvious to modify Takumi along the lines asserted by the Examiner.

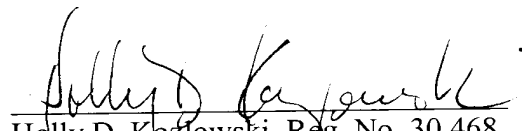
In the Official Action, the Examiner asserted that Payet teaches using less formaldehyde than other known processes and further teaches removing residual formaldehyde. While Payet discloses that his process uses less formaldehyde than other known processes, the Payet disclosure in fact emphasizes that less formaldehyde remains after the treatment process is complete as compared with other known processes (page 8, lines 14-17). Moreover, that Payet uses or results in less formaldehyde than other, unspecified known processes does not resolve the discrepancy between Payet, using liquid formaldehyde treatment, and Takumi, who uses vapor formaldehyde treatment. Accordingly, Payet does not resolve the deficiencies of Takumi.

It is therefore submitted that the substrates defined by claims 5, 6 and 9-14 are nonobvious over and patentably distinguishable from Takumi and Payet, whereby the rejection under 35 U.S.C. §103 has been overcome. Reconsideration is respectfully requested.

It is believed the above represents a complete response to the rejections set forth in the Official Action, and places the present application in condition for allowance.

Reconsideration and an early allowance are respectfully requested.

Respectfully submitted,



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